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ABSTRACT

This handbook presents course information, reading materials, and application research projects for a distance education course that focuses on helping inservice teachers of all grades and subject areas develop a useful set of concepts for fostering their students' critical reading and reasoning abilities. The course described in the handbook is designed to help teachers hone their own thinking skills while providing the basis for planning stimulating learning experiences. Special sections in the handbook provide resources for the high speed travel of the information superhighway and for drawing on specific teaching strategies especially conducive to students' constructive critical thinking. The course aims to engage the student (already a teacher) in constructive learning, which means that the course content includes developed and shared ideas derived from the course's major concepts. "Starting with What We Know" is Part I of the handbook; "Information Literacy" is Part II. Part III is "Conceptualizing Critical Reading and Thinking," while Part IV is "Teaching Strategies: A Resource." The final part, Part V, contains applications across grades and subjects and serves as a "teachers' think tank." (NKA)

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ED 404 624

Education L501:
Critical Reading in the Content Areas
Course Handbook

by
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Education L501:

Critical Reading and Reasoning in the Content Areas

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Overview of the Course

Aims of the Course:

This course is designed to help teachers of all grades and subject areas develop a useful set of concepts for fostering students' critical reading and reasoning abilities. These concepts can help teachers hone their own thinking skills while providing the basis for planning stimulating learning experiences. Special sections provide resources for the high speed travel of the information highway and for drawing on specific teaching strategies that are especially conducive to students' constructive, critical thinking. Finally, teachers' own ideas and plans will be presented in a "think tank" forum of international scope via the World Wide Web.

A major purpose of this course is to engage you in constructive learning, which means that you help create the content of the course by developing and sharing teaching ideas derived from the major concepts of the course.

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1. Where in the Internet is Carmen Antommarchi?

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PART I: Starting With What We Know

We'll begin this course with a common sense discussion of critical reading as we have all been practicing it throughout our college and professional careers. Critical reading begins with the assumption that every text, every composer of a text, has a point of view, which is one of a possibly infinite number of points of view on the topic or issue being addressed.

A point of view must eventually be developed, supported, communicated, and often defended, and the common structure for doing so is argument. Therefore, in some way, shape or form, every text contains one or many arguments, which readers may seek out and evaluate. Evaluation is a process that requires reason, emotion, andknowledge.

And since a point of view and its supporting arguments represent one of many ways of approaching an issue, the processes of comparison and contrast are essential. Comparing and contrasting points of views and arguments are how readers begin to grasp the complexity of issues and to evaluate the merits of particular positions. From this process comes the development of new knowledge.

Since critical reading is a way of expanding knowledge and making understanding more complex, it requires suspension of judgment until the reader has evaluated the arguments supporting a variety of points of view and made careful comparisons and contrasts among them. That is, one maintains a healthy skepticism toward all points of view until one has examined enough to find oppositions and partial oppositions and felt one's own initial position challenged.

Of course, being skeptical, however healthily, is not the end of critical reading. As a result of comparing and contrasting the points of views and arguments of different texts with suspended judgment, the reader is now in a well-grounded position to speculate and take the risk of fashioning his or her own point of view and supporting arguments, to move forward and add a new text to the complexity. And the process begins again, a lifelong cycle.

If you have studied in any discipline, this is the basic process of critical reading (and thinking) you have acquired. So you are here in the expert's seat!

But being an expert is not necessarily sufficient for being a teacher or curriculum planner. Therefore, we start where we are in order to go further into the vast territory of educational theory and curriculum planning, beginning with a conceptual orientation to critical reading and thinking. In this section of the course, you will explore a selected set of concepts that have been explored in the literature on critical reading and thinking.

Point of View:

Just as there is an infinite number of points in a circle, there is an infinite range of points of view on any issue. Depending on where you are positioned, another point of view may be next to yours, close to yours, far away, or directly opposite. Each point of view provides visibility into some aspects of the issue but is blind to others. As a reader and thinker, you need to understand as many points of view as possible to understand the issue and actually move around to see the issue from different angles.

Example: The legend of "The Five Blind Men and the Elephant" is perhaps the best known literary exemplification of point of view. Here the "view" is tactile rather than visual, but the principle is that wherever you stand, you will experience only part of the whole. Another example is Akira Kurosawa's

wherever you stand, you will experience only part of the whole. Another example is Akira Kurosawa's 1950 film "Rashomon," in which the story of a murder is told from the point of view of five different witnesses, including the dead person himself. These stories seem so different from one another that one may think only one represents "the truth," but the point of the film is that they are all "true" in the partial way that all stories are, because they are told from a particular point of view.

Activity to Experience the Concept: Here is an activity to immerse you and your students into the notion of "point of view." Take a plain rubber ball or other spherical object and hold it in one hand while marking the top, bottom, and sides with the other. Then toss the ball to someone else and ask them, without turning it after catching it, to mark the top, bottom, and sides, and then toss it to someone else. The rule always is that one must hold the ball as one has caught it and mark the positions. When everyone has marked the ball, look at all the points and ask, "now where are the true top, bottom, and sides?" Not only will be there no way to determine which are true, but the fact that the markings that determined them for each person are no longer distinguishable from all the other markings further emphasize the relative nature of the concepts of "top," "bottom," and "sides." These positions can be identified only from particular points of view, and these may differ somewhat or radically among individuals or groups.

Now take an inflatable globe and carry out a similar activity. The point of this activity is to emphasize that, while the globe has magnetic poles that provide one frame of reference for identifying "top" or "bottom," saying that one is in fact up and the other down is an artifact of point of view. In fact, being a sphere, the planet earth has no objective "top," "bottom," or "sides." Now relate this observation to the way Americans are taught to view the globe, the hemispheres, the northern and southern cultures of the world. To what extent do the metaphors of "up" for north and "down" for south influence people's attitudes toward societies and nations? What other geographical metaphors embed points of view and therefore attitudes or judgments?

Argument:

An argument is an expository structure that develops a position on an issue by presenting evidence or other support and teaching a conclusion or outcome. One easy way to think about argument structure is through the acronym IPSO, standing for Issue, Position, Support, Outcome. Arguments can also be thought of as hypotheses, theories, or models. The basic elements of all of these are the same as those of IPSO. Argument is the basic structure of academic thought. All knowledge in the disciplines is furthered through the construction, comparison, and testing of arguments of various sorts.

Example : If we look at our own field of education, we can see that competing arguments abound. In reading education, we have long been hearing about "the great debate" between skills or phonics based approaches and whole language approaches. Another major controversy in education is whether or not we should have a national curriculum, and, if so, how its specific contents should be determined. We also havewidespread disagreements on whether U.S. schools are doing a good or poor job of (pick one or more) (a) educating students for future careers, (b) keeping up with other countries, (c) meeting the needs of all children, (d) developing talent and leadership, (e) using technology to good advantage, and so on. We don't have to look very closely to see that all of these issues have many sides, not just two, and to even begin to understand them and what positions we might reasonably take, we have to try out many points of view.

An Activity to Experience the Concept: Students from middle grades on up can use the IPSO structure mentioned above to identify major arguments in what they read. One of the clearest examples of this argument structure is the Declaration of Independence. Have students read this document and look for the:

Issue: Question or problem being addressed

Position: The stance taken by the writer(s) or speaker(s) the suggested answer to the question or solution to the problem.

Support: Evidence, reasons, logic, examples, principles, emotions,

etc. that make the case for the position.

Outcome: What happens (short term and/or long term) if the position and support are accepted? Or, what conclusion does this line of reasoning suggest?

IPSO ANALYSIS OF THE DECLARATION OF INDEPENDENCE

ISSUE:

How might people secure their inalienable rights to life, liberty, and the pursuit of happiness from a government that does not acknowledge these rights?

POSITION:

A government that ignores these rights should be replaced by one that is of and for the people.

SUPPORT:

The present (British) government has not assented to needed local laws.

It has deliberately made participation in governance inconvenient if not impossible.

It has dissolved local governance bodies without cause,

It has interfered with free passage of citizens across the land.

It has manipulated the judicial system by controlling appointment of judges.

It has maintained an army separate from the people's interests but in the people's midst and at their expense.

It has attacked the people with imported mercenaries. It has imposed taxes without consent. It has out off trade with the rest of the world. It has incited civil unrest. It has ignored petitions for redress. Etc., etc.

OUTCOME:

Short-term: The decision to secede and the Revolutionary War.

Long-term: The United States of America as it is today

Comparison and Contrast:

These basically are the same process but each with a different twist, the first emphasizing likenesses, the second differences. They work together, demonstrating the relational nature of knowing. To know a thing (object, idea, etc.), one has to know at least some of the other things that give it a context. Finding points of likeness and difference among phenomena is one of our most important analytical tools.

Example: The fundamental process of categorization depends upon comparison and contrast. Comparisons give us larger groups, and contrasts give distinguishing characteristics for forming categories within the larger groups. In English, we have basic categories of prose, poetry, and drama, all with underlying shared characteristics that make them all literature. Prose, differentiated from the other major groups, is further categorized by differences between fiction and nonfiction, and then we have various genres within these. Zoology has its taxonomy, classification system with continuous subdivisions of groups consisting of like members, e.g. mammals, by differences that form subgroups, e.g. canines and felines.

Suppose you decided to make a study of "pigs in literature." Some of the places you might find these pigs include "The Three Little Pigs," Orwell's *Animal Farm*, Jane Smiley's novella *Moo*, A. A. Milne's *Winnie the Pooh*, and E.B. White's *Charlotte's Web*. In each of these works (and the many others you may know about or find) a pig or some pigs are anthropomorphized and given roles and characters suggestive of human behavior. In your analysis of these elements, you might first concentrate on differences, delineating the unique porcine qualities in each story.

The three little pigs may represent our middleclass, comfortseekingselves, pursuing the ideal of home ownership and oblivious to the meaner elements in society out to cheat or do worse. The pigs in Orwell's allegory, on the other hand, are among those meaner elements themselves, aggrandizing power and declaring themselves "more equal than others." The pig in Smiley's social satire is a giant porker named after a former Secretary of Agriculture who has eaten himself into immobilized immensity and become the most American of celebrities, a world recordholder. Piglet in the Pooh stories, in contrast, is a little creature with many of our own most endearing qualities, including intelligence, empathy, and a fondness for sweets, while Wilbur is half-courageous, half-shy, and above all hopeful about life.

Now we must ask ourselves, what do these and other pigcharacters have in common, that is, what is the basic human metaphor in pigs? Is it that pigs as a species somehow seem capable of accepting any projection of human nature we may wish to direct at an animal surrogate? Does it lie, perhaps, in a paradoxical mix of ambition and love of comfort, of voracity and vulnerability, of intelligence and languor? Thus do comparison and contrast work together in literary criticism, as in other scholarly pursuits.

An Activity to Experience the Concept: In the manner of the example given above, have students choose any animal, or other type of character, to study in various kinds of reading materials. It might be a chicken or a fox, it might be a cowboy or a princess, or for science fiction fans it might be a robot or space explorer. At elementary levels, such an activity can reveal to young learners how characters are developed and how our own attitudes are shaped by the characters we meet in stories. At higher levels, students may begin to think about cultural information that is handed down through stories and how racial, national, and gender stereotypes are formed.

Inquiry projects all rely heavily on comparison and contrast. When a student has defined an issue or question, the next step is to find the supporting material that will help in the development of a position (yes, IPSO is at work again). The question may be a historical one, a simple "what happened" query. To find out what happened in the past, one goes to different accounts, primary and secondary. Some of these may agree, some may partially agree, and some may disagree. The reader compares to extract the

may agree, some may partially agree, and some may disagree. The reader compares to extract the commonality of accounts, and contrasts to determine the various points of view and arguments represented. Eventually, out of this analysis comes a synthesis of one's own position, which one then supports and draws a final outcome or conclusion from. This process can be carried out at appropriate levels and with appropriate materials in elementary, middle, junior and senior high.

Suspension of Judgment:

To rush to judgment is human nature, and to be quick on the trigger is a well glorified attribute in American cinema, from Westerns to police thrillers. Heroes don't dawdle they act! Only comic characters get lost in philosophical conundrums while the action sweeps by them. But in life, quick judgment is often poor judgment, especially when it results in unthoughtful decisions, unexamined attitudes, or incompleteunderstandings.

Judgment (in terms of reaching a conclusion) is a late, not an early stage in problem-solving. But since our self-interest and emotions are so often involved in issues significant to us, holding back judgment may require great strength and will. Therefore, most people must work consciously on suspending judgment while they listen to several points of view and arguments, thoughtfully compare and contrast these, and then reflectively reach the best judgment possible at a given point in time. But it is an effort for which the ultimate reward will be wisdom.

Example: If you are like most people, you have been in a situation where two or more people who have experienced conflict among themselves come to you separately with their side of the story. Usually, each party will have a well-rehearsed, absolutely convincing version of what happened and why that person was in the right (in contrast to the others). The first person might have aroused your righteous indignation. The second might have given you pause to reflect on the accuracy of the first account while you tended to believe the new one. The third might have been the one that caused you step back and realize that you really don't know what happened, and you can't hope to explain till you've heard at least these three people talking among themselves. Or to put it another way, one convincing statement can give you something to believe; two convincing but opposing statements can put you in a position to take a side; but three convincing but opposing statements make you realize that the issue is not as simple as you might have thought and requires thought.

Activity to Experience the Concept: Most genres of fiction, but especially mysteries, thrillers, and plots fashioning on complex relationships will lead readers in many directions before revealing the surprise at the end who is the culprit, what is the end of an adventure, or why has someone concealed one's past from another. Even a true narrative may require us to put aside quick judgments or conclusions and wait till all the story's been told. Think about books in your own reading experience in which the author seemed at first to be conveying one judgment about a character or a situation and then changed that perception entirely, perhaps more than once. For example in the Russian tale, *Ivan Ivanovich*, a woman tells the story of a terrifying night ride in a sleigh through frozen woodlands with a pack of ravenous wolves in pursuit. One by one, she relates, the wolves snatched away her three children, starting with the smallest, so when she finally arrived at the edges of the village she was entirely alone. The picture of a mother driven almost mad by terror and grief is depicted with great vividness, but then one astute listener in the audience begins to unravel her story, and in the end she is exposed as a murderer, having flung one child after another to the wolves to save her own skin.

Find books and stories at your students' grade in which perspectives and judgments about characters and situations change. Read a story aloud to your students, stopping at intervals to ask students what has happened so far and what they think of particular characters and events. If they have changed their minds and attitudes during the story, have them discuss these changes, when they occurred, and why, making

and attitudes during the story, have them discuss these changes, when they occurred, and why, making conscious the process of revising judgment. Then have them choose other stories and books to read to determine whether and how their minds change during the reading, and whether they thought the author intended for this change to take place. They can then try their hands at writing stories with changing plots and characters themselves and share with each other, discussing the students' stories in the same way you discussed the one you read aloud.

As they have more and more experience with the ways in which angles in stories can change, they will be more likely to suspend judgment in other stories they read, knowing that a good writer will put some false leads and surprises in a narrative. Have students read each others' efforts and give feedback on how well the change(s) of perspective worked.

Healthy Skepticism:

Skepticism is healthy when untainted by negativity, cynicism or bitterness. The healthy skeptic holds judgment from coming prematurely to rest, but does not stash it on the shelf. The healthy skeptic asks for more information, another opinion, solid evidence, or a strong line of reasoning. A habit of mind forms that refuses to be pushed along, and thoughtfulness becomes a way of life. Once the inner healthy skeptic has emerged to the fore of one's many possible selves, the normal response to most problematic situations will be "let's find out more."

Example: As we have become increasingly exercise conscious, more and more advertisements appear on television and in other visual media showing people with perfectly shaped and toned physiques using particula workout devices which get them to walk, pedal, step, roll, pull, push, etc. in ways that supposedly target certain areas of the body for tightening and strengthening. We have also seen many "before" and "after" images of miraculously slimmed bodies after use of a diet product or program. Not surprisingly, claims for this merchandise are often shown to be highly exaggerated if not downright bogus. Twenty minutes on a machine three times a week, or sipping lunch out of a can, just isn't enough to produce the ideal human forms that are themselves perpetrated by advertisers. Yet the robustness of the advertising industry suggests that our skepticism as consumers may not be healthy enough. Whenever something is for sale, whether it is a product, a process, or a politician, skepticism is in order, and repressing the impulse to pursue every promise of easy fulfillment of a dream that might itself have been implanted by the seller will improve your life and environment while preserving your bank balance.

Activity to Experience the Concept : As suggested above, advertising in the visual media, whether magazines, television, or billboards, is rich ground for developing healthy skepticism. Advertising, moreover, is aimed at all ages, beginning with very young children. Toys may be represented in videos as having fantastic powers and effects resulting in very real disappointment when they merely obey the laws of physics in real life. Adolescents are targeted for implanted fantasies regarding whatever gender stereotypes are popular at a given time but always with the bottom line of a certain vision of sexual attractiveness, usually with body images, colors, and features that few can emulate. Have students find magazine advertisements or tape video clips that illustrate principles of persuasion that may nurture negative attitudes toward self and others, create expensive fads, encourage purely materialistic values, or lead to behaviors that are unhealthy for people or the environment.

Students should have free rein to consider expensive, ridiculous, or harmful outcomes that could ensue from really believing the messages of advertisers, and then consider the extent to which they and their peers are in fact influenced by such messages.

Grounded Speculation and Risk-Taking:

Critical reading and reasoning are not purely cognitive activities. Emotion and imagination are important components, emotion to account for the value-laden aspect of knowing and judging, imagination to project one's thinking beyond the present and known to the possible and to decide when a risk is worth taking. Risks, moreover, can be both intellectual and emotional. One takes a great risk when one gives up a long-held practice or cherished belief because of new knowledge or an expanded perspective. People who have outgrown prejudices can attest to the discomfort of dealing with others, often family or close friends, who hold to these attitudes. Giving up an intellectual stance can be even more traumatic.

As educators, especially those of us who are relatively seasoned, we have seen the knowledge base of our field change in many ways, so that accepted wisdom in one decade may be utterly discounted in another. One example is the change in views of assessment, as we see a shift from standardized, discrete item tests to more global forms such as authentic task or portfolio assessment. Changing from a quantitative to a qualitative paradigm in many areas entails considerable risk for manyeducators, more than some would feel comfortable taking.

Example: Readers at all grade levels, up to and including college, vary in the degree to which they are willing to take risks in thinking beyond a text. For example, some readers may prefer only very explicit and clear poetry, while others will be willing to let verbal images impinge on their own emotions and experiences and join into the meaning making of the poem themselves. Robert Frost's poem "The Road Not Taken" has a very clear metaphor that, moreover, has been quoted and explained so often that most readers feel very confident of the poem's meaning, and for that reason it is regarded as a modern classic. But a poem by Frost' contemporary Wallace Stevens, "Thirteen Ways of Looking at a Blackbird," is not so easily grasped. True, it is a series of Haikulike stanzas that do show different views of a blackbird, but the underlying metaphors, those alternative meanings that give literature its depth, may not be so clear as Frost's forked road. Yet the very ambiguity of the poem makes it relevant to more people's experiences, because different experiences brought to bear will turn the poem in different directions, all of them interesting and "right." And each component of the poem can operate independently. If one is willing to speculate and take risks, a poem like "Thirteen Ways of Looking at a Blackbird" can be as satisfying as one that strikes one with a strong central meaning, or more so.

Activity to Experience the Concept : An excellent way to experience speculation and risk taking is to have students read stories without their endings and then speculate on what they think the endings will be, grounding their speculations in the story so far. Sometimes the teacher may provide an author's original ending, but sometimes it will be better if students negotiate among themselves what an ending will be, or decide to allow alternate endings to stand.

Many stories will end in ways that leave readers with uncertainties and unanswered questions. A resolution may be reached, but a good story will lead into the maze of open issues in real life. Students can also write their own stories that stop short or an ending, or end in a way the invites further speculation, exchange their stories, and continue each other's. Then authors and readers can discuss their speculations and decide whether they took appropriate risks

PART II. Information Literacy

WHERE IN THE INTERNET IS CARMEN ANTOMMARCHI?

"The best search engine is the one between your ears" Robin Johnson (Infoseek's CEO)

When I first started working on this course project, I found myself surfing the Internet and feeling

When I first started working on this course project, I found myself surfing the Internet and feeling overwhelmed by the discovery of what seemed to be an endless amount of "useful" educational locations that we could refer you to in your research. There was such an endless list of links that at one point I had to stop myself and reflect seriously on what I was doing. I seemed to be going everywhere and yet was nowhere. The term Internet is a good name for that vast amount of information found in the "virtual" net that traps you if you are not careful, if you don't search with a purpose and a set goal. In his October 28, 1996, *Newsweek* article entitled, "Search for Tomorrow," Steven Levy says: "Seek in the Internet and ye shall find...far more information than you could ever digest."

Navigating through the Internet and entering the World Wide Web can be as challenging as entering King Minos's mythological labyrinth in ancient Crete, especially if you have not learned how to manage it and you do not have a Daedalus to build wings for you to escape with, or an Ariadne to provide you with her guiding thread. The internet is a "network of networks" linking together computers all over the world to allow for the exchange of information through the use of hypertext. The World Wide Web has recently become an integral part of the Net. It is a powerful system designed to facilitate the interaction between connected computer systems and the documents they contain. But, do not despair, there are "Daedaluses' and "Ariadnes" out there to help you navigate your way in and out of the labyrinthine Web. They are called search engines and they work wonders to help the inexperienced "surfer" avoid the dangers of any old "Minotaur."

Search engines are sites that have been created to provide Web users with searchable databases. When you submit a term or phrase, they will seek information throughout the Web. They will then provide you with a "hit" list of Web pages that are pertinent to your topic. It is important for the new user to read the online instructions before using any of the search engines for the first time..

Most of the search engines use what are called "Boolean" searches which allow you to use words that they will keep linked together as a phrase rather than search the database entry for each one of the words separately. This provides for a more precise search that will not result in a multitude of unrelated result entries. Some of the available search engines are better than others, not just because the results are precise, but also because they are continually being revised and kept up to date with all the new entries in the different databases. In my searches I have found three to be most useful:

Alta Vista (http://www.altavista.digital.com/)

A huge and very fast web index of more than 30 million web pages. It is especially useful for academically related searches. It is best used in keyword searches.

Yahoo (http://www.yahoo.com)

Developed by graduate students at Stanford University. The acronym stands for "Yet Another Hierarchically Odiferous Oracle." It allows you to search the Web by narrowing down from large categories to a more focused search. The large categories include: Art, Business, Education, Entertainment, Environment, Government, etc.

Lycos (http://www.lycos.com/)

Developed by The Carnegie Mellon Foundation, it is often called "The Catalog" of the Internet. Lycos searches in around 5.07 million Web Pages and is kept uptodate by robotic technology.

Web and Print Resources:

GENERAL

INTERNET:

University of Pittsburgh's Belvedere Project : (http://advlearn.lrdc.pitt.edu/belvedere), Or (http://advlearn.lrdc.pitt.edu/advlearn/teachers/INDEX.HTM)

This site is located at the University of Pittsburgh where they are developing inquiry curriculum and tools to support critical thinking.

Curriculum Resource Center : (http://www.montclair.edu/Pages/CRC/Bibliographies/CriticalThinking.html)

A vast annotated bibliography of critical thinking resources prepared by Laura Bardroff Zieger at Montclair State University.

The Critical Thinking Center : (http://www.sonoma.edu/cthink.html)

Resources on critical thinking from Sonoma State University.

WWW Virtual Library : (http://www.w3.org/hypertext/DataSources/bySubject/Overview.html)

An extensive list of educational links by subject.

OnLine Books Page : (http://www.cs.cmu.edu/Web/books.html)

An inexhaustible resource about books available on the Web.

The OnLine Library of Electronic Texts : (http://etext.lib.virginia.edu/uvaonline.html)

A collection of online electronic texts prepared by the Electronic Text Center at the University of Virginia. You will find complete texts in English, German, French, Japanese, and Latin.

Teacher's Resource Center's Interdisciplinary Index : (http://www.bdd.com/forum/bddforum.cgi/trc/index/inter)

This site provides teachers with interdisciplinary connections to integrate the curriculum through the use of stories. It includes teaching ideas and information on selected authors.

ERIC Clearinghouse : (http://www.indiana.edu/~eric_rec/)

This is a complete resource on reading, English, and communication. It provides sources for educational materials, services, and lessons.

Citing Online Sources : (http://www.sjcme.edu/wellehan/citeonl.htm)

This location provides you with links that help you cite Internet-based sources in your research.

Education and Learning to Think : (http://www.ul.cs.cmu.edu/books/education/think001.htm)

This is an online report by Lauren B. Resnick which is published by the National Research Council, Washington,D.C. (1987). It considers the educational alternatives teachers have to teach their students "higher order" thinking skills.

Lesson Plans Using Internet Web Sites: (http://www.voicenet.com/~reevesk/)

Contains all types of lessons for using the internet in the classroom at different levels. It also includes Bloom's Taxonomy of Learning and how it can be used for teaching.

PRINT:

Adams, L. (1995). Instilling doubt: The "Truth Line." *Exercise-Exchange*. v41. n1. p. 21-22. Ryder, P. M. (1995). Critical Literacy subverted: early public schools, individualism, and the ideal of critical reading. ERIC document (ED386693).

Barell, John (1991). *Teaching for thoughtfulness : classroom strategies to enhance intellectual development*. New York : Longman. (LB1062 .B38 1991)

Bensley, D. A, & Haynes, C. (1995). The acquisition of general purpose strategic knowledge for argumentation. *Teaching of Psychology*. v22. n1. p. 41-45.

Hyde, Arthur and Bizar, Marilyn (1989). *Thinking in Context: Teaching Cognitive Processes Across the Elementary School Curriculum*. White Plains, NY: Longman.(LB1590.3 .H93)

Lozauskas, D. & Barrell, J. (1992). Reflective reading. *Science Teacher*. v59. n8. p. 42-45. Collins, C. & Mangieri, J. N. (1992). Teaching thinking: an agenda for the Twentyfirst century. ERIC (ED363916).

MacAdam, B. (1995). Sustaining the culture of the book: the role of enrichment reading and critical thinking in the undergraduate curriculum. *LibraryTrends*. v44. n2. p. 237-63.

Norris, Stephen and Ennis, Robert (1989). *Evaluating Critical Thinking. The Practitioners' Guide to Teaching Thinking Series*. Pacific Grove, CA: Midwest Publications. (LB 1590.3 .N64).

Paul, Richard (1993). *Critical Thinking: What Every Person Needs to Survive in a Rapidly Changing World*. Third Edition. Santa Rosa, CA: Foundation for Critical Thinking. (BF 441 .p38)

Pugh, Sharon L.; Hicks, Jean W.; Davis, Marcia; Venstra, Tonya (1992). *Bridging : A Teacher's Guide to Metaphorical Thinking*. Urbana, Ill. : National Council of Teachers of English ; Bloomington, Ind. : ERIC Clearinghouse on Reading and Communication Skills. (P301.5.M48 B75 1992)

Putnam, L. R. (1994). Reading instruction: What do we know know that we didn't know thirty years ago? *LanguageArts*. v71. n 5. p. 362-66.

Swartz, Robert J. and Parks, Sandra (1994). *Infusing the Teaching of Critical and Creative Thinking into Content Instruction*. Pacific Grove, CA: Critical Thinking Press & Software.

Tishman, Shari; Perkins, David; Jay, Eileen (1995). *The Thinking Classroom: Learning and Teaching in a Culture of Thinking*. Boston : Allyn and Bacon (LB1590.3 .T55 1995)

Walberg, Herbert, et. al. (1992). *Teaching for Thinking*. Reston, VA: NASSP Curriculum Council. (LB 1590.3 .T4)

LANGUAGE ARTS

INTERNET:

The WWW Virtual Library: Languages:
(http://www.hardlink.com/~chambers/HLP/WWW_Virtual_Library_Language.html)

This site provides links to all the languages known to humanity including Esperanto, Latin, and even Klingon.

Universal Survey of Languages : (http://www.teleport.com/~napoleon)

A site that also provides access to a large amount of world wide languages.

Yamada Language Center:(http://babel.uoregon.edu/yamada/famguides.html)

Extensive information on language families.

PRINT:

Elementary

Block, C.C. (1993). Teaching language arts: expanding thinking through student-centered instruction. ERIC (ED 366943).

Cawley, C. & Others. (1995). Journeys and destinations: the challenge of change. A language arts unit for grades 2-3. ERIC (ED 380952).

Coleman, S. & Others. (1994). Changing ideas and perspectives through persuasion:a language arts unit for grades 5-6. ERIC (ED 380950).

Commeyras, M. & G. J. (1995). Parole officers and the king's guard: challenges in understanding children's thinking about stories. *Language Arts*. v 72. n 7. p. 512-516.

Leland, C. & Harste, J. C. (1994). Multiple ways of knowing: curriculum in a new key. *Language Arts*. v71. n5. p. 337-345. Parment, G. & Others. (1992). Across the curriculum. *Learning*. v 21. n 3. p. 15-22.

Priel, K. & Others. (1994). Literacy reflections on personal and social change. A language arts unit for grades 4-6. ERIC (ED 380949).

Putnam, L. R. (1994). Reading instruction: what do we know now that we didn't know thirty years ago? *Language Arts*. v 71. n 5. p. 362-366.

Siemens, L. (1994). "Does Jesus have aunties?" and "Who planned it all?": learning to listen for "Big" questions. *Language Arts*. v 71. n 5. p. 358-361. Taylor, G. R. & Others. (1992). The whole language approach: panacea or myth? ERIC (ED 364828).

Middle School

Darlington, S. & Dake, D. (1994). Interdisciplinary curriculum possibilities for middle school visual and language arts education. *Middle Schools Journal*. v 25. n 5. p. 46-51.

Rosenberg, A. (1994). Futurescape. *Instruction: (Middle Years)*. v 103. n 6. p. 44-45, 48.

K-12

Corson, D. J. (1992). Language, gender, and education: a critical review linking social justice and power. *Gender and Education*. v 4. n 3. p. 229-254.

Gilbert, P. (1992). The story so far: gender, literacy and social regulation. *Gender and Education*. v 4. n 3. p. 185-199.

McLaughlin, D. (1994). Critical literacy for Navajo and other American Indian learners. *Journal of American Indian Education*. v 33. n 3. p. 47-59.

Myles, M. (1996). Changing our minds: negotiating English and literacy. ERIC (ED 390061).

Semali, L. M. (1995). Teaching media: English teachers as media and technologycritics. ERIC (ED 391500).

ENGLISH/ESL

INTERNET:

The English Server: (http://english-www.hss.cmu.edu/)

Supported and run by students and faculty at Carnegie Mellon University.

The Children's Literature Web Guide : (http://www.ucalgary.ca/~dkbrown/index.html)

This site provides internet resources of children and young adult books. It also has several on-line children's stories.

The Internet TESL Journal: (http://www.aitech.ac.jp/~iteslj/

Many TESL/TEFL/TESOL Links : (http://www.aitech.ac.jp/%7Eiteslj/ESL3.html)

ESL/EFL Articles on the Net: (http://www.aitech.ac.jp/~iteslj?Links/ArticleLinks.html)

CRC:Teaching Literature and Poetry:
(http://www.montclair.edu/Pages/CRC/Bibliographies/TeachingPoetry.html)

The Curriculum Resource Center at Montclair provides a bibliographical list of elementary and high school resources for teaching literature.

PRINT:

Elementary

Igoa, C. (1995). *The Inner World of the Immigrant Child*. New York, NY: St. Martin's Press, Inc.

Krug,M. & Fordonski, P. (1995). Improving recreational reading habits of elementary students. ERIC (ED386690).

Neff, N. & Others. (1995). Improving reading comprehension at the first grade level. ERIC (ED 386688).

Prados-Olmos, P. & Others. (1993). Students "do" process: bilingual students' interaction in a small cooperative learning reading group. *Bilingual Research Journal*. v17. n34. p. 41-69.

K-12

Bonne, F. (1995). How to read a short story: a linebyline critical reading guided by an author. *Writer's Digest*. v75.n8. p. 30-34. Myers, M. (1996). Changing our minds: negotiating English and literacy. National Council of Teachers of English, Urbana, ILL. ERIC(ED 390061).

Semali, L. M. (1995). Teaching media: English teachers as media and technology critics. ERIC (ED 391500).

Secondary

Adams, L. (1995). Instilling doubt: the "Truth Line." *Exercise Exchange*. 41. 1. p 21-22.

Charles, J. (1995). American Indian literature appropriate for secondary and middle level students. Paper presented at the Annual Spring Conference of the National Council of Teachers of English. ERIC (ED 382952).

Shipman-Campbell, A. (1995). Increasing secondary African-American and Latino students' opportunities to critically read, think, and write about cultural and gender diverse literature. ERIC (ED 387802).

Post Secondary

MacAdam, B. (1995). Sustaining the culture of the book: the role of enrichment reading and critical thinking in the undergraduate curriculum. *Library Trends*.v44. n2. p.237-63.

SCIENCE

INTERNET

Critical Issues in Science: (http://ncrel.org/sdrs/areas/sc0cont.htm)

Offered by *Pathways to School Improvement*.

Elementary Science this Month : (http://www.1me.mankato.msus.edu/ci/elem.sci.html)

Science Learning Network : (http://www.sln.org/)

This site is maintained by Mankato State University's College of Education. It contains science activities.

This site is maintained by Mankato State University's College of Education. It contains science activities, answers to frequently asked questions, information about important scientists, information about animales, etc.

PRINT:

Elementary

Weigman, B. A. (1993). Visual literacy, science process skills, and children's books. ERIC (ED 363328).

Middle School

Chyu, C.W. (1991). Teaching science to students with limited English proficiency through nested spiral approach. Paper presented at the Annual Meeting of Northeastern Region of the Association for the Education of Teachers in Science. ERIC (ED 348860).

Secondary

Jarvis, C. K. (1992). A model for integrating nontraditional skills and instruction from literature and art into science classroom activities. Paper presented at the CRESST Conference in Performance Assessment. ERIC (ED 353242).

Lazauskas, D. & Barrell, J. (1992). Reflective reading. *Science Teacher*. v 59 n 8. p. 42-45.

Pavlenik, J. A. & Tashiro, J. S. (1992). The graphics detective: an exercise in critical reading, experimental design and data analysis. *The American Biology Teacher*. v54. n7. p. 432-36.

MATHEMATICS

INTERNET:

Sim Calc: Simulations for Calculus Learning:(http://tango.mth.umassd.edu/simcalc/)

This site provides calculus teachers with innovative ideas for a more open curriculum through Mathematics for Change.

21st Century Problem Solving: (http://www2.hawaii.edu:80/suremath/home.html)

Problem solving across the curriculum activities provided by the University of Hawaii atManao.

Welcome to Mathematics Across the Curriculum : (http://math.unr.edu/MAC/)

PRINT:

Elementary

Dusterhoff, M. (1995). Why write in Mathematics? *Teaching Pre-Kinder*. v 25. n4. p. 48-49.

Forster, C. (1992). Teaching thinking and problemsolving in math: strategies, problems, and activities. ERIC (ED 379157).

BEST COPY AVAILABLE

Kjos, R. & Long, K. (1994). Improving critical thinking and problemsolving in fifth grade mathematics. ERIC (ED 383525).

K-12

Nelson, V. & Stanko, A. (1992). Math Safari. *Learning*. v 21. n1. p. 43-45.

Secondary

Ehlinger, J. & Pritchard, R. (1994). Using think alongs in secondary content areas. *Reading, Research, and Instruction*. v 33. n 3. p 187-206.

Adult Education

Kerka, S. (1995). Not just a number: critical numeracy for adults. ERIC (ED 385780).

SOCIAL STUDIES

INTERNET:

History/Social Studies Web Site for K-12 Teachers: (http://www.execpc.com/~dboals/boals.html)

This is a site set up especially for middle school and the secondary level. It provides teachers with documents, links, and online text files on several topics.

PRINT:

Elementary

Rowel, E. H. (1995). Critical questions about multicultural Big Books in the early childhood classroom. *Social Studies and the Young Learner*. v7. n4. p. 14.

Zarnowski, M. (1995). Connecting the past and the present: reading history. ERIC (ED 388979).

K-12

Bensley, D. A. (1995). The acquisition of general purpose strategic knowledge for argumentation. *Teaching of Psychology*. v22. n1. p. 41-45.

Simmons, J. S. (Ed.) (1994). Censorship: a threat to reading, learning, thinking. ERIC (ED374399).

Secondary

Vanderhooh, B. & Others. (1995). Real or fake? The phony document as a teaching strategy. *Social Education*. v56. n3. p. 166-71.

(1988). Two visions of the consquest: grades 9-12. ERIC (ED 349235).

Post Secondary

Freire, P. (1984). Word within world: a critical reading of the universe. *UNESCO Courier*. Feb. 1984. p. 29-31.

MUSIC

INTERNET:

Academic and Scholarly Music Resources :
(http://www.oberlin.edu/~library/Schol_Res/ref_schol_music.html)

K-12 Resources for Music Educators
:(http://www.isd77.K12.mn.us/resources/staffpages/shirk/K12.music.html)

PRINT:

K-12

Lee, N. R. (1991). Empowering music teachers: a catalyst for change. *Music Educator Journal*. v78. n1. p. 36-39.

Novack, J. (1991). "Shaken not Stirring": a case study of the political potential of rock music video. ERIC (ED 341109).

Sibbald, M. J. (1993). Aesthetic criticism in the music classroom. *Music Educators Journal*. v80. n2. p. 30-33.

Stating, K. (1991). What is higher order thinking in art and music? ERIC (ED 368618).

Post Secondary

Marley, J. & Price, H. E. (1992). Bringing music history alive: artifacts to explore historiography. *Research Strategies*. v10. n3. p. 134-37.

HOME ECONOMICS

INTERNET:

Family and Consumer Education Home Page: (http://www.inc.net/~clonge/)

This site provides ideas about family and consummer education.

PRINT:

Secondary

Freeman, M. (1992). Food for thought. *Vocational Education Journal*. v 67. n8. p. 28-29, 72.

Johnson, J. & Carlson, S. (1992). Transforming the philosophy and practices of secondary home economics teachers. Paper presented at the American Vocational Association convention. ERIC (ED 356367).

356367).

(1994). Potentials and possibilities. New Jersey: Montclair State College. ERIC (ED 385698).

Secondary-Post Secondary

Johnson, J. (1992). Teacher education reform: transforming the practice of Home Economics teachers through learning communities. Paper presented at the American Vocational Association convention. ERIC (ED 350487).

Stone, T. M. (Ed.). (1993). A future of choice! A guide to developing issue-based curriculum with process skills learned before and through content. ERIC (ED 386574).

Post- Secondary

Banes, K. C. (1992). Preparing Home economics leaders: critical skills. *Journal of Home Economics*. v84. n1. p. 28, p. 38-43.

Crawford, G. (1993). Developing student global perspectives through undergraduate family resource management. *Journal of Home Economics*. v85. n2. p. 9-15.

Kerka, S. (1992). Higher order thinking skills in vocational education. ERIC (ED 350487).

(1994). Academic integration supplement to the food science and nutrition curriculum guide. Lubbock, Texas: Texas Tech University. ERIC (ED 376285).

(1991). Integration of mathematics, science, and language arts principles in the Home Economics curriculum. Lubbock Texas: Texas Tech University. ERIC (ED 339888).

INDUSTRIAL ARTS

INTERNET:

Journal of Industrial Teacher Education :
(http://borg.lib.vt.edu/ejournals/JITE/v32n1/jite-v32n1.contents.htm)

This on-line journal contains articles on topics such as leadership development and historical leaders in the profession.

Journal of Technology Education : (http://scholar.lib.vt.edu/ejournals/JTE/jte.html)

This is an on-line forum for technology education.

Journal of Vocational and Technical Education : (http://borg.lib.vt.edu/ejournals/JVTE/jvte.html)

This site contains three on-line volumes of articles on topics such as: student selfdirectedness; employer involvement in schooltowork transition, etc.

PRINT:

K-Post Secondary

K-Post Secondary

Lewis, T. & Gagel, C. (1992). Technological literacy: a critical analysis. *Journal of Curriculum Studies*. v 24, n 2. P. 117-138.

Post Secondary

(1995). Basic skills curriculum for the graphics arts industry. Maryland: Calonville Community College. ERIC document (ED 384781).

Adult Education

(1995). Applied academic and workplace skills for collision repair and refurnishing technicians. Herndon, Virginia: National Automotive Technicians Education Foundation. ERIC document (ED 385776).

PHYSICAL EDUCATION

INTERNET:

The Library in the Sky : Site for Physical Education:
(http://www.nwrel.org/sky/Classroom/Health_PE/Physical_Education/Physical_Education.html)

This site provides Physical Education teachers with discussions, lesson plans, lists of resources, papers on different aspects of Physical Education, periodicals dedicated to the subject, and projects being carried out.

PRINT:

Elementary:

Cleland, F. E. (1994). Young children's divergent movement ability: study II. *Journal of Teaching in Physical Education*. v 13. n 3. p. 228-41.

Fredericks, A. D. (1992). The integrated curriculum: books for reluctant readers : Grades 2-5. ERIC (ED 384005).

Gerney, P. E. (1993). Teaching critical thinking (a practical approach). Paper presented at the Annual Meeting of the American Alliance for Health, Physical Education, Recreation, and Dance: Washington, D.C. ERIC (ED 357016).

Secondary:

McBride, R. & Knight, S. (1993). Identifying teacher behaviors during critical thinking tasks. *ClearingHouse*. v 66. n 6. p. 374-78.

Ocansey, R. T. A. (1995). Planning high school Physical Education lessons to encourage critical thinking. *International Council for Health, Physical Education and Recreation Journal*. v 31. n 2. p. 16-21.

K-12:

Kirk, D. & Tinning, R. (1992). Physical Education pedagogical work as praxis. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, CA. ERIC (ED 350296).

McBride, R. (ed.). (1995). Critical thinking in Physical Education...an idea whose time has come! *Journal of Physical Education, Recreation and Dance*. v 66. n 6. p. 21-52.

Ocansey, R. T. A. & Others. (1992). Promoting critical thinking in student teaching practice. *Journal of Physical Education, Recreation, and Dance*. v 63. n 6. p. 66-69.

Schwager, S. & Labate, C. (1993). Teaching for critical thinking in Physical Education. *Journal of Physical Education, Recreation, and Dance*. v 64. n 51. p. 24-26.

Tsangaridou, N. & Sredentop, D. (1995). Reflective teaching: A literature review. *Quest*. v 47. n 2. p 212-237.

K-Post Secondary:

Stier, W. F. & Others. (1994). The future of Physical Education survival or extinction. Paper presented at the Annual Meeting of the American Alliance for Health, Physical Education, Recreation, and Dance. ERIC document (ED 383644).

Secondary-Post:

Boyce, B. A. (1992). Making the case for the case method approach in Physical Education pedagogy classes. *Journal of Physical Education, Recreation, and Dance*. v 63. n6. p. 17-20.

Langley, D. J. & Others. (1993). Applying case method instruction in a pedagogy class. *Journal of Physical Education, Recreation, and Dance*. v 64. n 8. p. 61-65.

Post Secondary

Chapyator-Thomson, J. R. (1995). Multicultural considerations in physical activity: an introduction. *Quest*. v 47. n 1. p. 16.

Fernandez-Balboa, J. M. (1995). Reclaiming Physical Education in higher education through critical pedagogy. ***Quest***. v 47. n 1. p. 91-114.

McBride, P. E. (1992). Critical thinking an overview with implications for Physical Education. *Journal of Teaching in Physical Education*. v 11. n 2. p. 112-125.

Tinning, R. (1991). Teacher education pedagogy: dominant discourses and the process of problem setting. *Journal of Teaching in Physical Education*. v 11. n 1. p. 120.

Tinning, R. (1992). Reading action research: notes on knowledge and human interests. *Quest*. v 44. n 1. p. 114.

Zeigler, E. F. (1995). Competency in critical thinking: a requirement for the "Allied Professional." Quest. v 47. n 2. p. 196-211.

SPEECH AND DRAMA

INTERNET:

University of Waterloo's Electronic Library: Drama and Speech Communication(http://www.lib.uwaterloo.ca/discipline/drama/index.html)

PRINT:

Secondary:

McLlelan, F.R. I993). Strengthening adolescent identity formation through development and presentation of family literacy documents. ERIC document (ED 362901).

Vrazel, R. Jr. & Hoffman, H. (1991). The use of metaphor: towards rehabilitating oral/written skills of entry level theater students. ERIC document (ED367005).

Post Secondary:

Benson, T. (1991). Recent developments in the rhetorical study of film and television. ERIC document (ED 345307).

Perkins, S. J. (1994). Towards a rhetorical/dramatic theory of instructional communication. *Communication Education*. v 43. n3. p. 222-35.

MULTIMEDIA AND COMPUTERS

INTERNET:

Media Literacy Online Project : (http://interact.uoregon.edu/MediaLit/HomePage)

This is a site prepared and maintained by the Center for Anvanced Technology in Education at the College of Education at the University of Oregon-Eugene. It provides media resources and online readings on media literacy.

PRINT:

K-12

Semali, L. M. (1995). Teaching media. English teachers as media and technology critics. ERIC (ED 391500).

Secondary-Post

Cummins, J. & Sayers, D. (1995). *Brave New Schools: Challenging Cultural Illiteracy Through Global Learning Networks*. New York, NY: St. Martin's Press.

Meskill, C. & Swan, K. (1995). *Roles for Multimedia in the Response-based Literature Classroom*. National Research Center on Literature Teaching and Learning, Albany, NY. ERIC (ED 387803).

Part III: Conceptualizing Critical Reading and Thinking

In this section we move the register of the discussion up a notch to examine some of the prevailing concepts in the literature on critical reading and thinking. Many books and articles have been written on these topics, and you will find in them a veritable dictionary of terms and concepts that are sometimes overlapping, sometimes quite unrelated.

Rather than take on the whole dictionary at once, we have selected a limited number of themes to explore. These will serve as a kind of guided tour of the universe of critical reading and thinking to orient you before you take off on your own.

These themes are as follows:

1. Critical Reading and Thinking

2. Dialogical Reasoning: Multiple Perspectives

3. Argument & Persuasion: Analysis and Evaluation

4. Mindfulness: Metacognition, Self Awareness, and Mental Management

5. Empathy: Moral and Ethical Commitment

6. Creativity: Imagination and Metaphorical Thinking

7. Inquiry and Integration: Making, Authoring, Moving Forward

1. Critical Reading and Thinking

Discussion:

The term "critical" is etymologically related to "critique," and it has also assumed a meaning similar to that of "important" or "making a crucial difference." To read critically is to read alertly but open-mindedly, using one's own knowledge to understand and evaluate the information and reasoning of the text. One may agree, partly agree, or disagree with the text, but one always thinks about WHY. Very importantly, a critical reader is willing to alter stances if warranted by evidence and reasoning. Usually the goal of critical reading is to be able to use information and arguments from various sources to arrive at one's own position on a topic or issue. This ability is important in any subject or career. To read critically, one should be able to:

- draw inferences (read between the lines)
- analyze lines of reasoning
- apply logic
- weigh evidence
- evaluate language
- relate different readings to each other

Critical reading is also an attitude. This attitude is one of curiosity and judgment. It means one is willing to make the effort to reach the best possible understanding of any issue from different viewpoints.

Readings:

Bibliographic Reference:

Chapman, Ann (1993). "What is Critical Reading?" In A. Chapman, Ed., *Making Sense: Teaching Critical Reading Across the Curriculum*. New York: The College Entrance Examination Board, 312.

Relevant to Grades: Middle through Secondary

Critical Synopsis:

Defining reading as "the construction of flexible and usable knowledge (4)," this writer describes understanding as "a multidimensional model built by the reader, a complex in which the text, the reader, and the reasons for reading are all ingredients (4)." From this premise she poses the following operations as components of critical reading:

- Drawing on knowledge of language, previous reading and experiences
- Deciding what is important in the text
- Finding relationships and structures that help organize the content of the text
- Monitoring understanding by forming and testing hypotheses
- Problem-solving by reading backward and forward
- Drawing inferences and identifying needed additional information
- Evaluating and selecting information and inferences
- Checking new and previous knowledge against each other
- Organizing new understanding in a meaningful way for later use.

In brief, critical reading is a way of processing text so that understanding becomes quality knowledge. Chapman believes that unless critical reading using some or all of these operations together is taught and practiced under guidance, students will tend toward passive reading that does not necessarily lead to new learning.

Bibliographic Reference:

Arons, Arnold (1989). "Critical Thinking." In *A Guide to Understanding Physics Teaching*. New York: John Wiley & Sons, 313327.

Applicable to Grades: Secondary & College (focused upon but not confined to science teaching)

Critical Synopsis:

In this chapter, Arons discusses ten thinking and reasoning processes he believes underlie critical thinking in the sciences:

- Consciously raising questions
- Being clearly aware of gaps in needed information and knowledge
- Discriminating between observation and inference or conjecture
- Using language carefully so that terms have clear and accepted definitions
- Probing for assumptions, especially unstated assumptions, behind reasoning
- Drawing valid, supported inferences and recognizing when inferences cannot be drawn
  Using hypothetical/deductive reasoning, that is, setting up hypotheses justified by data and

- Using hypothetical/deductive reasoning, that is, setting up hypotheses justified by data and projecting the implications of these hypotheses
- Discriminating between inductive and deductive reasoning
- Developing intellectual selfreliance by testing one's own ideas for internal validity and consistency
- Developing consciousness of one's own thinking/reasoning processes

Arons goes on to argue that these processes are necessary to enlightened citizenship as well as becoming proficient in science. He criticizes science instruction in the United States for not adequately fostering "abstract logical reasoning" in students. Finally, he suggests a way to help faculty develop effective strategies for meeting this deficiency.

Bibliographic Reference

Munro, George and Slater, Allen (1985). "The Know-How of Teaching Critical Thinking." *Social Education*. April, 284-292.

Applicable to Grades: Middle through Secondary

Critical Synopsis:

The authors describe a framework developed in an Ontario school for teaching critical thinking across the curriculum. They define critical thinking as "skills used to determine the authenticity, accuracy and worth of information and knowledge claims." They also discuss supporting skills and concepts for developing critical thinking. Their framework includes three major steps of (1) identifying the learning outcome, (2) identifying the background knowledge and skills needed for this outcome, and (3) identifying the specific knowledge or concepts associated with the new skill.

Then eight substeps for instruction are discussed. This system is illustrated with a lesson on teaching how to distinguish between "fact" and "opinion." This is a good article for visually-oriented learners because much of the information is given in diagrammatic form.

Bibliographic Reference:

Beyer, Barry (1985). "Critical Thinking: What Is It?' *Social Education*. April, 270-273.

Relevant to Grades: All, Especially Middle and Up

Critical Synopsis:

Beyer begins by stating what he thinks critical thinking is not, a general and amorphous collection of abilities, and then goes on to his very explicit of notion of what it is, "the assessing of the authenticity, accuracy and/or worth of knowledge claims and arguments," which consists of discrete skills, including:

- Distinguishing between verifiable facts and value claims
- Determining the reliability of a source
- Determining the faculty accuracy of a statement
- Distinguishing relevant from irrelevant information, claims or reasons
- Identifying unstated assumptions
- Identifying ambiguous or equivocal claims or arguments
- Recognizing logical inconsistencies or fallacies in a line of reasoning

- Distinguishing between warranted or unwarranted claims
- Determining the strength of an argument

He also defines six procedures common to all of these skills with implications of how to teach them.

Bibliographic Reference:

Beyer, Barry (1985). "Teaching Critical Thinking: A Direct Approach." *Social Education*. April, 297303.

Applicable to Grades: Middle through Secondary

Critical Synopsis:

Beyer advocates the direct teaching of critical thinking skills, which he specifically defines as "assessing the authenticity, accuracy, and/or worth of knowledge claims and arguments." He argues that explicit instruction systematically applied is the only way to assure that students acquire the tools they need to be good assessors of information and ideas. He also believes that critical thinking is a "frame of mind" as well as a number of specific thinking operations.

His suggestions include strategies for introducing a critical thinking skill, both inductively and directively and strategies for guided practice in critical thinking.

Bibliographic Reference:

Paul, Richard (1993). "Critical thinking: Fundamental to Education for a Free Society." In *Critical Thinking: What Every Person Needs to Survive in a Rapidly Changing World*, Third Edition. Santa Rosa, CA: Critical Thinking Foundation, 181-202.

Relevant to Grades: All

Critical Synopsis:

In this paper, Paul presents his "signature" argument that education should foster the ability to resist egocentric thinking and reason by taking into account multiple and opposing viewpoints. He believes that only if we develop our minds with this kind versatility and complexity will we retain our democratic ideals amidst the challenges and stresses of rapid technological and social change. He argues that students, like all people, are by nature egocentric, and education has traditionally simply indoctrinated them into the prevailing views of their society. Continuing this trend, he believes, will not prepare students for a shrinking and changing world. Rather, from the earliest years children should be encouraged to think for themselves through dialogue and constructive debate, so that they will develop the habit of thinking about positions and realities other than their own when addressing any complex problems. Toward this end, the curriculum needs to be revamped at all levels to foster multilogical reasoning based on argument and negotiation.

Bibliographic Reference:

Marzano, Robert J. (1992). "A Rationale and Framework for Teaching Thinking Tactics." In J.W. Keefe and H.J. Walberg, Eds. *Teaching for Thinking*. Reston, VA: National Association of Secondary School Principals, 15-25.

Relevant to Grades: 2 -12

Critical Synopsis:

Marzano provides an overview on approaches to teaching thinking skills, based on a continuum from explicit to implicit methods. His exemplar for explicit methods is Barry Beyer's fivestep approach to specific strategy teaching, which includes introduction, experimentation, reflection, modification, and new application. His exemplar for implicit methods is Richard Paul's program, which shows teachers how to customize lessons across content areas to introduce and reinforce a number of thinking strategies. His own program, "Tactics for Thinking," is described as a compromise approach. His tactics, which are introduced as early as the second grade, include attention control, deep processing, powerthinking, concept attainment, pattern recognition, extrapolation, evaluationof evidence, and everyday problem solving. He suggests a K-12 curriculum with specific times for introducing tactics so that teachers know what students have already learned.

Bibliographic Reference:

Francis Schrag (1992). "Nurturing Thoughtfulness." In J.W. Keefe and H.J. Walberg, Eds. *Teaching for Thinking*. Reston, VA: National Association of Secondary School Principals, 27-34.

Relevant to Grades: 4 -12

Critical Synopsis:

This writer uses a variety of metaphors to convey his sense of critical thinking as a complex process involving various combinations of not only skills but character traits or "virtues" within particular contexts. Learning to think critically, he believes, is not so much like learning to drive a car as like learning to explore and be courageous. Learning thoughtfulness requires an environment that encourages thoughtful behavior and provides models of thoughtfulness. He views the environment of most school as factorylike, which he contrasts with the environment of a science laboratory, which is geared toward discovery rather than reproduction. Despite the fact that schools are not likely to change radically in a short time, conventional classrooms can be altered to provide a better context for developing thoughtfulness, and supplementary environments can be created as supplements. A system of six main dimensions for assessing thoughtfulness in the classroom is described: (1)Fewer topics are covered indepth (rather than many superficially); (2)Lessons display coherence rather than fragmentation; (3)Students are given time to think in responding to questions; (4) Teacher poses appropriately challenging questions and tasks; (5) Teacher models thoughtfulness and demonstrates problem-solving; (6) Students must explain and support answers and conclusions

Bibliographic Reference:

Paul, Richard (1993). "Critical Thinking and the Critical Person." In *Critical Thinking: What Every Person Needs to Survive in a Rapidly Changing World*, Third Edition. Santa Rosa, CA: Critical Thinking Foundation, 203-227.

Relevant to Grades: All

Critical Synopsis:

In this paper Paul continues the themes developed in the previous paper, emphasizing the difference

In this paper Paul continues the themes developed in the previous paper, emphasizing the difference between "strong sense" and "weak sense" critical thinking. The former is based upon multi-logical reasoning and is embedded in the Socratic ideal of the examined life and mind. He warns about the danger of social studies education being a form of indoctrination into accepted views rather than an education for effective social problem solving, and he believes that emphasis on "weak sense" critical thinking, or training in the tools of logic only, will simply lend credence to sociocentric teaching and the fostering of closed-mindedness.

2. Dialogical Reasoning: Multiple Perspectives

Discussion:

During any election year, we are acutely aware of the conflicts of interest that drive the political activity of the United States. Name a social institution or issue, and you can draw as many points of view toward it as you like, some close to each other, others in vehement opposition. Special interest groups, lobbyists, campaign managers, and politicians themselves virtually badger us with strong statements for one point of view or another, until we are weary and tired of them all. Who can believe them anyway? They're just like any other kind of advertiser out to get something we have to give, not providing fair and trustworthy information. So we click off channels, put down newspapers, log off the internet.

But when we hear of a government that cannot tolerate dissent, where opponents are jailed or disappeared, where elections are not honored, where the military has taken over the function of police, we realize that the noise, bombast, confusion, and quarreling that are part and parcel of a democracy are well worth the bother. However passionately we may hold to our own views and truly believe that if enlightened, all our fellow citizens would share them, we must realize that the glue of democracy is the fact that people disagree and can talk about their disagreements. All groups, however unpopular or marginalized, may claim their stake in society and use the apparatus of government to preserve or enhance it, resulting in a society always in a dynamic state of perpetual dispute and negotiation.

Dialogical thinking takes into account the many legitimate points of view that may be take on any topic or issue. Its pillars are openmindedness and the willingness to step outside a comfortable perspective to really understand other perspectives and arguments. Because our natural inclination is to defend the views we find so convincing to ourselves, we might have to force ourselves to see an opposing view from the perspective of someone who accepts it. But if we want a society in which conflicts of interest are negotiated rather than one in which some views are privileged and others suppressed, we must become skillful at dialogical thinking.

Reading plays a crucial role in dialogical thinking. If the premise of d ialogical thinking is that we must understand multiple and opposing viewpoints to understand any complex issue, the implication is that we must seek out different perspectives. Whatever the medium, whether print or electronic, written language is the form in which most human communications and knowledge are stored. Therefore, to avoid being dependent on a single source of information and point of view, people need to be discerning readers.

Readings:

Bibliographic Reference:

Paul, Richard (1993). "The Contribution of Philosophy to Thinking." In *Critical Thinking: What Every Person Needs to Survive in a Rapidly Changing World*, Third Edition. Santa Rosa, CA: Critical Thinking Foundation, 405-443.

Relevant to Grades: All

Critical Synopsis:

Paul defines philosophy as "a discipline that formulates issues that dialogue and reasoned discourse between conflicting viewpoints (405-06)," a definition that also fits his notion of "dialogical thinking." As an art, philosophy differs from science in that science is a collaborative effort in which participants agree to limit the issues they consider to questions that can be answered quantitatively with replicable methods. Being an enterprise that is more individualistic within shared frameworks of broad questions and complex issues that do not lend themselves to quantification, philosophy and its methods of critical discussion and dialogical exchange provide a firmer foundation for education than psychology with its scientific practices. Paul argues that children with their inquiring minds are natural philosophers, a point he illustrates with a transcript of fourth graders discussing abstract concepts. He also provides a series of contrasts between the assumptions of "didactic theory" and of "critical theory" covering 24 dimensions, including the issue of breadth vs. depth of learning, the place of values, and transfer of learning to new situations.

3. Argument & Persuasion: Analysis and Evaluation

Discussion:

Argument as a rhetorical structure is a tool for dialogical thinking and reading. As noted in the introduction to this lesson, most expository prose is argumentative, so looking for the structure of the argument or arguments presented is a powerful analytical strategy. One device for determining arguments is IPSO, an acronym for Issue, Position, Support, Outcome, illustrated above by the structure of the Declaration of Independence.

An argument is clear to the extent that it addresses a well-defined issue and takes a definite position on the issue. It is strong to the extent that its supporting evidence and reasoning are strong. It is persuasive to the extent that the outcomes projected from it seem appropriate and desirable. These are criteria by which we can evaluate arguments. They also provide guidelines for constructing strong and valid arguments of our own.

IPSO is not the only heuristic device for evaluating and constructing arguments. Another is BIO, standing for Beliefs, Implications, and Outcomes. A person's beliefs are like the premises from which an entire argument is generated. By tapping into the beliefs a writer or speaker brings to an issue, BIO goes deeper into the sources of the position s/he takes. This approach may be especially effective when the premises are not voluntarily stated.

For example, suppose that in a school board election, a slate of highly conservative candidates are running against a slate of progressive candidates. At first the conservative group might openly advertise its affiliation with other ultra conservative groups and its goals of establishing a back-to-basics curriculum, standardized testing, using strong discipline to deal with all behavior and attendance problems, and eliminating many aspects of sex and drug-abuse education. The progressive group might begin by acknowledging its alliance with groups and interests identified as "liberal" and endorse an issuesbased curriculum with emphasis on problem-solving, portfolio assessment, an alternative schools program, and an extensive sex and drug-prevention program. At this point, the premises from which each group operates might be clear or easy to infer. However, as the election campaign proceeds and various accusations are traded back and forth, both group may change their rhetoric to appear less extreme to the

point where, in fact, they seem to be on common ground. Now the flyers on both sides emphasize improvements in achievement for all students, curriculum enrichments, protecting children from society's destructive elements, and involving parents more in their children's education. The underlying beliefs for these goals, and how these beliefs were connected with those of other groups, are no longer so clear. Getting at these beliefs, while now more difficult, is a crucial part of evaluating their arguments and deciding whom one really wants to vote for.

Many other structures for analyzing and evaluating arguments are given in the literature on critical reading and thinking.

4. Mindfulness: Metacognition, Self Awareness, and Mental Management

Discussion

A simple way to define "mindfulness" is to call it "enlightened conversation with the self." One pays attention to what one is doing or saying, and why. Mindfulness depends to a large extent on the degree to which one is interested, energized, and purposeful (as opposed to bored, lazy, and passive). Students who "tune out" are choosing not to be mindful of the content and activities in the classroom and are perhaps privately mindful of memories, fantasies, or strong feelings. As teachers, of course, we want students to use their mindfulness for learning, and getting them to do that may constitute the single greatest challenge of the profession!

The concept of "metacognition," which literally means "above thought," is usually applied to the task of monitoring one's own cognitive processes during a learning or problemsolving task. When applied to reading, it refers to awareness of when one has understood or failed to understand, of the connections between what one is reading and other knowledge one has, and the conscious use of strategies to overcome comprehension failures or the integration of new with prior knowledge.

For example, a reader with no background in physics may read a *Scientific American* article on quarks with some understanding, but there will be many points in the article that remain opaque, and at the end the knowledge may seem to have little connection with other things the reader knows. Metacognitively, the reader may or not be aware of the amount or depth of understanding, questions that the article has raised but not answered, and possible relevance of this information to the reader's life or interests. When there is no metacognitive awareness, the article is put down, the reader is pleased to have gotten through it, and most of what was read and understood is forgotten. When there is great metacognitive awareness, the reader will observe the superficiality of understanding, deliberately decide whether or not to be satisfied with that, and then think about how this new knowledge seems relevant: as an item to research more in the future? As a metaphor for ideas in another field? As background knowledge to use in other reading?

"Mental management" takes the idea of metacognition a step into the practical realm and draws on a business analogy to make the point that, like any resource, one's mind must be "managed" for maximum efficiency and well being. It is a metaphor that works better for some than for others. Instead of the metacognitive image of hovering over one's own mind as an observer, which may appeal to the scholar, here one visualizes a successful executive investing resources for greatest return. Offer your students both metaphors for mindfulness, and then encourage them to come up with their own.

Readings:

Bibliographic Reference:

Bibliographic Reference:

Pugh, Sharon; Hicks, Jean; Davis, Marcia; Venstra, Tonya (1992). "II Personal and Cultural Aspects of Metaphor," including "Metaphors and Self Awareness," "Metaphors and the Enabling Process," and "Extending Self to Cultural Awareness." In *Bridging: A Teacher's Guide to Metaphorical Thinking*. Urbana, IL: National Council of Teachers of English, 32-66.

Applicable to Grade(s): All

Critical Synopsis:

These chapters deal with the powerful influence that metaphors have on how we view ourselves, view others, and are viewed by others. Language may be observed for its metaphorical content, and strategies can be developed from what we learn that help us change unproductive behaviors or negative attitudes that get in the way of learning and understanding. Metaphors are also excellent tools for raising self awareness and developing cultural understandings . As in all chapters in this book, all discussion is illustrated with teaching ideas that can be used at many grade levels.

Bibliographic Reference:

Tishman, Shari; Perkins, David N., and Jay, Eileen (1995). "Mental Management," and "Mental Management: Pictures of Practice." *The Thinking Classroom: Learning and Teaching in a Culture of Thinking*. Boston: Allyn and Bacon, 65-72, 73-96.

Relevant to Grades: All

Critical Synopsis:

In these chapters the authors define the term "mental management" as the activity of reflecting on one's own thinking and evaluating it for better practice. They discuss thinking pitfalls and the advantages of effective mental management, which includes expanding one's "cognitive resourcefulness," developing independent and responsible thinking, and becoming more strategic and foresightful in one's thinking. They consider such management a "learnable aspect of intelligence." They advocate incorporating explicit guidance in mental management by explaining and demonstrating concepts in the classroom, organizing discussions and other interactions that are opportunities for experiencing these concepts, and giving good feedback to students on their mental management practices.

Specific activities to promote mental management include the following:

- "Put on Your Thinking Cap" as a way of getting young students to look at themselves as thinkers.
- "FourThought," a four-step approach that helps students avoid thinking "defaults."
- "Modeling Mental Management," a demonstration of teacher modeling of dealing with the obstacles and challenges to maintaining good thinking habits.
- "Taking the Plunge," a discussion of starting points for beginning mental management instruction.
- "Continuing On," ways of making mental management an ongoing theme in the classroom culture.
- "Trouble-shooting," a discussion of common concerns about teaching principles of mental management.

Bibliographic Reference:

Ellen Langer (1989). *Mindfulness*. New York: Addison-Wesley Publishing Co.

Ellen Langer (1989). *Mindfulness*. New York: Addison-Wesley Publishing Co.

Relevant to Grades: All, especially middle, secondary, and college

Critical Synopsis:

The author contrasts the concept of mindfulness with mindlessness, which she describes as automatic thinking that leads to mental entropy over time. The costs of mindlessness, she claims, are a limited self-image, prejudice, and stagnation. Mindfulness is the attitude of being open to new information and ideas, alert to the details and novelty of every situation, and willing to live in a state of "creative uncertainty," in which one is always in a questioning and problem-solving mode. She relates mindfulness to health and work situations as well as to learning. This book is readable and full of interesting examples of the concepts she introduces.

5. Empathy: Moral and Ethical Commitment

Discussion

Empathy is the ability not only to project oneself into the experience of another living being, but also to connect with that experience in an emotionally meaningful way. Empathy may also be viewed as the opposite of egocentricity, the state of mind characterized by intense self-involvement. While this attitude may be tolerable in very young children, it soon becomes a social disability that isolates the older child or teenager and stunts psychological growth. We expect children to grow in their understanding that all people have the same feelings and needs as they do, and therefore they can use their own experience as a metaphor for the experiences of others.

Empathy is also a necessary underpinning to harmony in a diverse society. The ability to relate one's own feelings and experiences to those of others prevents us from discounting the humanity and right to justice of any other group. Without empathy, people can exploit, enslave, or exterminate others, cruel behaviors that have characterized human history, and still prevail in conditions of war, but which it is an important goal of education to extinguish.

Many school subjects offer opportunities to enter into the experiences of others, including literature, history, social studies, music, art, and science. Here, emphasis is placed on developing empathy for social purposes, specifically for the prevention or elimination of prejudiceand toward the enhancement of a just society.

Readings:

Bibliographic Reference:

Paul, Richard (1993). "Critical Thinking and the Nature of Prejudice." In *Critical Thinking: What Every Person Needs to Survive in a Rapidly Changing World*, Third Edition. Santa Rosa, CA: Critical Thinking Foundation, 229-266.

Relevant to Grades: All

Critical Synopsis:

Drawing on the work of William Graham Sumner and Jean Piaget, Paul argues here that prejudice, as a form of egocentric and sociocentric thinking, is the norm rather than the exception in human thought and

form of egocentric and sociocentric thinking, is the norm rather than the exception in human thought and attitudes. Education must actively to develop critical consciousness in students so that they deliberately seek to be rational and fairminded in their reactions to and evaluations of others. The purpose of such education is to encourage students to take control of their own thinking and confront the mechanisms of prejudice as they serve selfinterest, leading to an ethical choice to dismantle one's own prejudices.

Bibliographic Reference:

Paul, Richard (1993). "Critical Thinking, Moral Integrity, and Citizenship: Teaching for the Intellectual Virtues." In *Critical Thinking What Every Person Needs to Survive in a Rapidly Changing World*, Third Edition. Santa Rosa, CA: Critical Thinking Foundation, 319-332.

Relevant to Grades: All

Critical Synopsis:

Paul argues that strong sense critical thinking is as involved with values and personal responsibility as with cognition. The three must be integrated to achieve the ideal of multilogical reasoning, self awareness, and what he calls the intellectual "virtues:"

- Intellectual Courage
- Intellectual Empathy
- Intellectual Good Faith or Integrity
- Intellectual Perseverance
- Intellectual fairmindedness
- Faith in Reasoning

6. Creativity: Imagination and Metaphorical Thinking

Discussion:

Imagination is involved in all learning though we may not recognize it as such. Reading for meaning, because it always involves inferencing and speculation, is by nature an imaginative activity. Rosenblatt's concept of transactional reading (see reference below) regards reading as a creative collaboration between reader and text, a whole process that is more than the sum of its parts or subskills. When reading, therefore, students should always be encouraged to reflect, discuss, make connections, ask questions, offer interpretations, and listen to the ways that others have read the same text.

Teachers can go even further in encouraging students to use their imaginations in learning, an approach that may otherwise erode as school seems to turn into an increasingly stultifying experience in which all control over knowledge is wielded from the outside. They can provide opportunities for deliberate uses of the imagination in virtually any subject, encouraging rather than suppressing the faculty from which a major source of energy for learning is generated. By recognizing and nurturing the inherent imaginative element in all thought, teachers can help students blossom into divergent thinkers, creative problem solvers, empathetic human beings, and, who knows, artists in their own right.

Readings:

Bibliographic Reference:

Paul, Richard (1993). "The Logic of Critical and Creative Thinking." In *Critical Thinking: What Every Person Needs to Survive in a Rapidly Changing World*, Third Edition. Santa Rosa, CA: Critical Thinking Foundation, 101-122.

Relevant to Grades: All

Critical Synopsis:

Paul develops the thesis that critical thinking is essentially involved in creativity. Creativity, being involved with mastering or producing, and criticality, being involved with assessing or judging, are complementary and operate mutually in "excellent thought." In this paper he also develops his notion of "logic" through a series of examinations into the logic of concepts, of academic disciplines, of language, of questions, of student thinking, of teaching, of literacy, and of logic itself.

Bibliographic Reference:

Pugh, Sharon; Hicks, Jean; Davis, Marcia; Venstra, Tonya (1992). "I. The Nature of Metaphors and Metaphorical Thinking," including "Metaphorical Thinking," "How Metaphors Work," and "Kinds of Comparison Involved in Metaphorical Thinking." In *Bridging: A Teacher's Guide to Metaphorical Thinking*. Urbana, IL: National Council of Teachers of English, 229.

Critical Synopsis:

The authors establish their definition of metaphorical thinking as "drawing parallels between apparently unrelated phenomena to gain insight, make discoveries, offer hypotheses, wage arguments, and accomplish other such useful purposes." (2) George Lakoff's major treatment of metaphor is used to establish four basic categories involved in the dynamics of metaphor: Grounding (the background knowledge required to be able to understand the comparison being made), Form (the main structural likeness between the two items being compared), Correspondences (the points of comparison within the form); and Connotation (the emotional implications of the metaphor, whether positive or negative). This system is used to examine the kinds of comparisons that may be involved in metaphor as broadly defined. The authors argue that a broad definition of metaphor is more useful to the concept of metaphorical thinking because different ways of making imaginative comparisons all entail "attending to likenesses, to relationships, and to structural features in seeking what Aristotle called 'similarities in dissimilarities." All conceptual discussion in these short chapters are accompanied by concrete teaching ideas.

Bibliographic Reference:

Rosenblatt, Louise M. (1978). *The Reader, the Text, the Poem: the Transactional Theory of the Literary Work*. Carbondale: Southern Illinois University Press.

Critical synopsis:

Transactional theory claims that the reader shares in the creation of the meaning of any text through a dynamic process that involves the reader, the text, the author, and their cultural environment. With each reading of a text, these come together in unique ways, creating, in effect, a new text. In developing this pespective, Rosenblatt distinguishes between "efferent" reading, which is a means toward an end, and "aesthetic" reading, which is a performance experienced for its own sake. In efferent reading, the transaction is minimized because the goal is simply to take information from the text. In aesthetic reading, the transaction has unlimited possibilities because it is a critical, creative self-changing experience in

the transaction has unlimited possibilities because it is a critical, creative self-changing experience in which consciousness and understanding are expanded. This theory has generated "reader response' approaches literature, in which students become aware of their active relationship to the text and participation in the creation of its meaning. Such strategies involve dialogical discussions guided but not dominated by the teacher, often emphasizing the relationship among literature and other forms of art.

7. Inquiry and Integration: Making, Authoring, Moving Forward

Discussion:

Learning is finding answers to questions. These questions may be self-generated or suggested by others, and they be explicit or implicit. Therefore, education has always had a natural connection to inquiry, which we may define as organized questioning, and past great educators like Socrates and John Dewey placed inquiry at the very heart of their philosophies.

Inquiry based teaching and learning puts students in control by encouraging them to formulate their own purposes and strategies for finding things out. Such learning involves all the other concepts of critical reading and thinking discussed here because by its very nature it involves analytical reading, evaluating arguments, considering multiple perspectives, being mindful, using imagination, and projecting oneself empathetically into new contexts and experiences.

Through inquiry students also learn the tools of information literacy, as they learn to navigate their way through the myriad and growing sources of information available to them and to assess, select, distill and keep sharpening focus on a problem or question of their own definition. All subjects at all levels lend themselves to this approach in some way, and the outcome from repeated experiences with inquirybased learning would be minds well educated and experienced in productive and independent thought.

Readings:

Bibliographic Reference:

Brown, Ann L. and Campione, Joseph C. (1992) "Students asResearchers and Teachers," In In J.W. Keefe and H.J. Walberg, Eds. *Teaching for Thinking*. Reston, VA: National Association of SecondarySchool Principals, 49-57.

Critical Synopsis:

Beginning with the position that traditional schooling was intended to produce an educated elite, these writers argue that concepts of literacy must be altered to prepare a diverse population of students for the 21st Century. They suggest strategies that promote active learning. Based on research with marginally prepared students, a strategy of "reciprocal teaching" involves students as questioners, reasoners, and problemsolvers in the learning of concepts.

Collaborative classrooms support individual and group research, which can in turn be supported by technology although this is not a necessary feature and cannot alone promote inquiry learning. A classroom can become a community of learners, or a collective of such communities, in which students are responsible for their own and others' learning.

Bibliographic Reference:

Bateman, Walter L. (1990) *Open to Question: The Art of Teaching andLearning by Inquiry*. San

Bateman, Walter L. (1990). *Open to Question: The Art of Teaching andLearning by Inquiry*. San Francisco: Jossey-Bass Publishers.

Relevant to Grades: All, especially secondary and college

Critical Synopsis:

This book, written by an experienced junior college teacher, is organized around three questions: (1) Why teach by inquiry? (2) How can you teach by inquiry? and (3) How can you start? Each question heads a section in the book that deals with theory and application ideas. Topics dealt with under applications include discovering personal biases; coping with rigid beliefs; testing hypotheses; discovering assumptions (related to human nature and race), rules, and insights; and evaluating evidence. The final part on getting started supports the teacher in making basic changes in instructional approaches with both emotional and practical advice. The book is written in a friendly style enhanced by stories and metaphors. It provides very easy access to the concept of inquiry teaching.

Bibliographic Reference:

Christensen, Linda (1989). "Writing the Word and the World." *English Journal*, 78(2), February, 103-107.

Relevant to Grades: Middle through College

Critical Synopsis:

This article describes how a secondary English teacher combined the principles of critical literacy, or literacy for empowerment, and inquiry to strengthen the skills and knowledge of her innercity students. She tells the story of how her students had come into her class having done poorly on their SATs, and she had them do research on that particular test and normed placement tests in general, which are instruments with questionable histories and validities. Although their outward situations had not changed, the students found that they could arm themselves with knowledge that would prepare them to take stands against unjust practices. Most importantly, they ceased seeing their situations as inevitable and therefore unchangeable but realized that they had access to tools and resources for using knowledge to overcome obstacles. At the end she addresses the issue of using knowledge of harsh situations for power and not for further reason for despair.

Teaching Strategies: A Resource

Discussion:

In this unit, a variety of teaching strategies that lend themselves to the teaching of critical reading and thinking are briefly described with references given for those who seek further information. These are provided as resources for you to use in your plans for teaching there is no "homework" required here!

To find out more about a strategy, click on the item in the list below:

- directive teaching
- directed questioning activity
- mediative teaching
- generative teaching

- generative teaching
- collaborative teaching
- scaffolding
- collaborative apprenticeship learning
- inquirybased teaching
- reciprocal teaching
- guided student generated questioning

Directive Teaching:

Directive teaching strategies are intended to help students comprehend and acquire information as a basis for critical reading and reasoning. They are "directive" in that they require students to accurately imitate those behaviors or skills that are modeled, presented, or instructed by the teacher. As a major teaching mode, directiveness is likely to inhibit rather than support critical thinking, but used appropriately it can provide a necessary resource for students' efforts to understand and solve problems.

Directive strategies place teachers in the role of presenter of information. They include:

- structuring information;
- selecting goals to be achieved, methods for achieving them, and criteria by which achievement will be evaluated;
- providing organization;
- checking for understanding and retention; and,
- rewarding performance that demonstrates the desired outcomes.

The objectives of directive strategies are often stated in such terms as "to understand," "to demonstrate," "to acquire," "to recall." They are often associated with the "knowledge" level of Bloom's taxonomy although higher levels may also be facilitated.

Examples:

- teaching grammatical concepts, editing techniques, procedures of any kind;
- teaching a particular kind of analysis, such as argument analysis, comparison/contrast, finding main and subordinate ideas, etc.; and
- teaching particular criteria for evaluation, such as logical
- strength of argument, type and reliability of evidence, etc.

References:

Costa, A., Hanson, R., Silver, H. and Strong, R. (1985). "Four Instructional Strategies," In A. Costa, Ed. *Developing Minds: A Resource Book for Teaching Thinking*. Alexandria, VA: Association for Supervision and Curriculum Development. Directed Questioning Strategy

Directed Questioning Strategy

The Directed Questioning Strategy (DRA) is a teacher-directed activity useful when students are reading expository texts with especially difficult or new concepts. The DRA also acknowledges that students may not have developed higher-order thinking strategies and allows for incorporation of modeling and teaching of new strategies. The teacher plans advance cognitive organizers and questions to place strategically to evoke complex thinking and relating of new concepts to known material. It also encourages students to make predictions or define their own purposes for reading narrative text by

encourages students to make predictions or define their own purposes for reading narrative text by generating openended questions. Through this strategy, teachers can direct learning through instruction that focuses on restructuring information in the text.

DRA may be "text-explicit" or 'text-implicit."

Steps for "text-explicit" DRA:

- Teaching identifies learning objectives.
- Teacher examines concepts presented in text and "chunks" them together for presentation.
- Teacher creates a pre-reading overview and activity to address each chunk (e.g. a diagrammatic map of one section of the map showing main concepts and their relationship to each other.)

Steps for "text- implicit" DRA:

- Teacher gives content focused pre-question to set an objective for reading just before students read a section of the text.
- Teacher presents adjunct questions just after reading the text which cue students to reflect on particular concepts.
- With guidance and practice, students learn to create their own structured overviews and guiding questions when they read independently.

Reference:

Ryder, Randall James (1991). "The Directed Questioning Activity for Subject Matter Text." Journal of Reading, 34(8), May, 606-611.

Mediative Teaching

Mediative strategies enable students to learn to evaluate different points of view in controversial issues, respect the opinions and beliefs of others, and use alternative problemsolving processes, sometimes called "heuristics," from the Greek *eureka*, meaning "I have found it!"

The teacher mediates by raising questions and dilemmas that tease students' curiosity and stimulate their inquiry, and by causing them to arrive and test their own conclusions, apply the concepts they have induced, consider alternative theories or explanations, and experiment with alternative problemsolving approaches. The teacher refrains from making value judgments about the students' ideas but supports and coaches them as they formulate and evaluate ideas on their own.

Students are expected to use inductive and deductive reasoning to produce an explanation and to support that explanation with both logical and evidentiary proof. By employing these strategies, students become more autonomous, increase their problemsolving skill, and show greater respect for the varying opinions and points of view of others.

Examples :

- Guiding discussion on controversial issues and dilemmas, including those that students raise;
- "Dialogical reasoning"-- encouraging reasoning from different points of view toward the end of reaching the best understanding of an issue;
- Having student respond to literature from their own perspectives and substantiate interpretations

from the text, not toward the end of reaching the "right" interpretation but toward seeing how multiple interpretations can be valid;
- Using literature with multicultural content to define and analyze perspectives of different groups in a pluralistic society.

References:

Costa, A., Hanson, R., Silver, H. and Strong, R. (1985). "Four Instructional Strategies," In A. Costa, Ed. *Developing Minds: A Resource Book for Teaching Thinking*. Alexandria, VA: Association for Supervision and Curriculum Development.

Generative Teaching

Generative strategies help students create new knowledge and develop novel and insightful ways of approaching and solving problems.

Teachings might stimulate students' imaginations by inviting creative imagery, using metaphors, and posing hypothetical or seemingly bizarre situations. They withhold value judgments so as not to stifle students' "creative juices." Planning includes developing standards with students, making criteria explicit while giving students control over applying them, and exploring alternative approaches and strategies for any task.

Generative strategies may be used in expressive writing, developing solutions to nonroutine problems, inquiry, and artistic expression. In low risk situations, students can become more creative in their use of new materials, more insightful and intuitive in offering solutions to problems, and more skillful at using metaphors in thought and expression.

Examples:

- journal keeping;
- process writing approaches which emphasize original ideas,
- multiple drafts, and deep revision;
- imaginative reading and writing, with emphasis on creativity before correctness or conformity to a particular form or genre;
- multiple media projects, such as writing and art, dramatization, video, etc.

References:

Costa, A., Hanson, R., Silver, H. and Strong, R. (1985). "Four Instructional Strategies," In A. Costa, Ed. *Developing Minds: A Resource Book for Teaching Thinking*. Alexandria, VA: Association for Supervision and Curriculum Development.

Collaborative Teaching

Collaborative strategies provide a way to structure student groups for learning. They help students think and solve problems together, successfully accomplish tasks, both academic and nonacademic, and develop social skills. Benefits of collaborative include the following:

- Positive interdependence is created by distributed leadership and group ownership of product, materials and resources, and rewards.

materials and resources, and rewards.
- Verbal interaction and communication skills are required and therefore developed.
- Individual accountability results when students take responsibility for their own part of a shared project.
- Social skills are important and must be practiced by all participants.
- Students not only learn the academic content but also develop and employ higherlevel thinking skills. They develop greater appreciation of group members and learn to apply social skills in groups beyond the classroom.

Examples:

- organized groupbased activities such as debate, structured controversies, panel discussions, etc.;
- peer response and editing in process approaches to writing;
- small group discussions within the structure of wholeclass lessons and discussion;
- peer tutoring; and
- major group projects with group responsibility and partially or entirely shared credit for outcome.

References:

Costa, A., Hanson, R., Silver, H. and Strong, R. (1985). "Four Instructional Strategies," In A. Costa, Ed. *Developing Minds: A Resource Book for Teaching Thinking*. Alexandria, VA: Association for Supervision and Curriculum Development.

Scaffolding

A scaffold is a temporary structure put up to enable builders to work on the permanent structure, at which point the scaffolding is taken down. The metaphor in teaching here is of a teacher or peer providing support until a learner has become independent. Someone learning t drive a stick shift, for example, may begin with a visual diagram that shows the pattern of the positions. This is a scaffold that may be taken away once the pattern becomes habitual. An example of a "scaffold" in school learning is the analytic tool "IPSO" introduced earlier to guide students in thinking about the parts of an argument. Once the notion of the parts has been internalized, there is no need to keep filling in the slots of an IPSO analysis, and indeed, it would be quite monotonous or awkward to keep repeating this one simple structure. IPSO's purpose is not to become a permanent sorting device but to help students develop a consciousness of and skill with the structure of an argument, and then let it infuse their critical reading and writing.

The metaphor of the scaffold implies a planned, externally devised means for getting students to new levels of understanding or competency. It assumes that teachers know where students are and where they can go with this kind of support. Providing scaffolding when students can already progress independently is as redundant and indeed obstructive as leaving up the carpenters' scaffolding after a building has been constructed. On the other hand, it can be a very useful metaphor for conceptualizing what a particular student needs to get traction and move ahead.

Learners can also build their own scaffolding, as when they use problem-solving strategies in mathematics such as diagraming information in verbal problems. Using concept maps and outlines to understand the structure of expository prose is another kind of self-built scaffolding. Teaching students to build their own scaffolding to achieve new understanding will result in the most powerful application of this strategy.

Collaborative Apprenticeship Learning:

This model is based on a set of beliefs derived from the work and theories of Lev Vygotsky, who argued that learning was always a social process. Key beliefs include:

- Learners are actively attempting to make sense out of their world, using their background knowledge as a frame of reference from which to generate hypotheses.
- Working in collaboration with an instructor and peers within an apprenticeship process, learners construct knowledge beyond what they could do independently (re the Zone of Proximal Development in Vygotsky's model).
- Language is used as a tool for learning.
- Students develop language and thinking competencies by using these processes regularly for meaningful problemsolving tasks.

Implications to be drawn from these beliefs are that teachers should (1) start with what students know, (2) set up ways for them to share that knowledge, (3) building on each other's knowledge collaboratively, (4) find ways to have students use their language as a tool for learning, and (5) support students' initiative so that they are increasingly in control. The procedure or model itself includes the following steps:

- Select major concept: Expand and modify to include student interests.
- Elicit student interest: Make public what students know about the concept Use focused freewriting and brainstorming.
- Build on what students know: Demonstrate or model the concept/procedure.
- Place student-generate work or ideas within theconceptual framework.
- Focus on student reading: Students use what they already know and the concrete activities they have experienced to make predictionsabout text material.
- Discover areas of student confusion: Use small groups or think/write logs so students can express what is or isn't clear.
- Encourage application of ideas: Students independently or in collaboration engage in longterm projects of interest to them.
- Use writing response groups and peer research groups.

Reference:

Bayer, Ann Shea (1990). *Collaborative Apprenticeship Learning: Language and Thinking Across the Curriculum, K-12*. Mountain View, CA: Mayfield Publishing Company.

Inquiry Based Teaching

Inquiry based teaching draws on the premise that students should participate in the construction of knowledge through their own questioning and research activities. The following principles from Walter Bateman's book, *Open to Question*, are summarized by Jamie Kirkley, instructor at the IU Student Academic Center:

- Begin with a problem and collect data that presents contrasting views.
- Create tension by considering data that presents alternative views.
- Discuss, share opinions, articulate different viewpoints among participants.
- As the teacher, stand aside and let students grapple with the tension and solve the problems they have posed.

- Support collaboration among students.
- Have students compare their thinking with other ideas and think about the grounding for what they propose.
- Have students look for more data or information to inform their planning and decisions
- Review (collectively and as a teacher) the outcomes of the enterprise and reflect on how participation has resulted in learning and knowledge building.

Reciprocal Teaching:

This is a strategy developed for enhancing text comprehension. Teacher and learners take turns leading discussions about material they have read independently. Steps are as follows:

1. Teacher or learner initiates discussion by asking a question about the material.

2. Students answer, clarify, and explain among themselves to reach a better understanding of the answer to the question.

3. Another student (not the discussion initiator) summarizes the understanding established by the group.

4. The discussion initiator gives the gist or significance of the understanding, perhaps by stating an outcome or prediction.

Reference:

Brown, Ann L. and Campione, Joseph C. (1992) "Students as Researchers and Teachers," In In J.W. Keefe and H.J. Walberg, Eds. *Teaching for Thinking*. Reston, VA: National Association of Secondary School Principals, 49-57.

Guided Student-Generated Questioning :

This strategy supports students in posing and answering their own and each other's thoughtprovoking questions by providing them with a set of generic question stems, including the following:

What is a new example of. . .?

How would you use . . .to. . .?

What would happen if. . .?

What are the strengths and weaknesses of. . .?

What do we already know about. . .?

How does. . .tie in with what we learned before?

Explain why. . . .

Explain how. . . .

How does . . .affect . . .?

What is the meaning of . . .?

Why is . . .important?

What is the difference between . . .and . . .?

How are . . .and . . .similar?

What is the best . . ., and why?

What are some possible solutions for the problem of . . .?

Compare . . .and . . .with regard to . . .

How does . . .affect . . .?

What do you think causes . . .?

Do you agree or disagree with this statement: . . .? Support your answer.

These generic questions provide patterns for questions specific to particular content, which in turn leads students to elaborate knowledge and explanation and to analyze text content. Answering the question requires a cognitive representation, which supports comprehension and memory. Studies have shown the effectiveness of this strategy in high school and college, and it could be applied to earlier levels as well.

Reference:

King, Alison (1992). "Facilitating Elaborative Learning Through Guided StudentGenerated Questioning." *Educational Psychologist*, 27(1), 111-126.

Trying it Out: Teacher's Think Tank

This is the part of the course that is created by students who give permission for their teaching plans to be posted as resources for others. As you have noted from the list of assignments, you will write four teaching plans. These can be on any subject and at any level -- all the same, or at different subjects or levels. If you are already teaching a course you could focus on that, or if you want to prepare for different possible assignments, you could write a greater variety of plans. It is up to you.

Your choices are represented graphically in the following grid. You can choose one cell four times, four different cells one time each, or any combination in between.

	Pre-school	Kinder-3	Grades 4-6	Grades 7-9	Grades 10-12	Post-Secondary	Adult Educ.
Language Arts							
English							
ESL							
Foreign Languages							
Social Studies							
Science							
Math							
Music							
Art							

Below is the format to follow for writing a teaching plan, and following that is an example of a teaching plan using resources found in the course materials and two stories in print (which are summarized).

Format for Trying it Out: Your Teaching Plan

Grade level(s) and subject(s):

Major concepts incorporated in your plan:

Main teaching strategies you will employ:

Idea:

- Content and purpose:
- Materials involved:
- Activities students will engage in:
- Outcomes or productions of the activities:
- What you hope students will learn:

Evaluation:

- Assessment of how well students learned (or what they learned):
- Evaluation of your plan:

Reflection:

Your reflection on the plan and, if possible, its implementation. This reflection can be speculative or retroactive or both. How do you think the experience of what you've planned will help students develop as critical readers and thinkers? What other comments would you like to make, having thought through and perhaps tried out this idea?

Trying It Out: Your Teaching Plan

Crossing Borders Through Literature

Grade level(s) and subject(s): Secondary English or possibly social sciences

Major concepts incorporated in the plan:

- Critical reading, including reading analyticall and interpretatively
- Dialogical reasoning, especially taking multiple perspectives
- Moral reasoning and empathy, projecting oneself into a different cultural experience
- Comparison/contrast, among stories and also between empathy and experience
- Creativity

Main teaching strategies you will employ:

- Reader response
- Mediative teaching
- Guided student-generated questioning
- Generative teaching
- Collaborative learning

Idea

Content and Purpose:

This literature-based idea involves creative/critical reading and writing. It is centered around two narratives written by Native Americans which involve variations on the theme of passages and crossing boundaries, including personal, cultural, and geographical boundaries. Through reading and responding to these narratives, students can project themselves into and explore the multiple realities of young people in cultures that embrace spiritual and natural values that may be different from the readers' own. Through writing their own narratives, students can enter into the worlds of the story-tellers and experience how their own stories, along with those of te writers os the narratives provided, are significant threads in the vast tapestry of human meaning.

Materials Involved:

Two short stories 9see summaries below) in addition to tools for writing, including computers and appropriate writing and editing software. Materials will also be needed for whatever medium of creative display students choose, e.g., class book, WEB page, etc.

Big Eagle, Duane (1983). "The Journey." In Simon J. Ortiz, Ed. *Earth Power Coming: Short Fiction in Native American Literature*. Tsaile, Arizona: Navajo Community College Press. 227-231.

Qoyawayma, Polingaysi (Elizabeth Q. White, as told to Vada F. Carlson). (1964). Chapter Two. *No Turning Back*. Albuquerque, NM: The University of New Mexico Press. 13-26.

Activities students will engage in:

Students will read and respond to each story separately by sharing the thoughts, experiences, and feelings evoked by the stories, their sense of the storyteller in each, what they found especially interesting in each story, and questions or doubts they had. Further discussions will center on comparing the stories for like themes. In these stories, the following themes may be identified, though it is important for students themselves to have the opportunity to find and share their own themes before the teacher adds perspectives.

- Living in two worlds
- Ways of learning
- Crossing boundaries, real and metaphorical
- Journeys, real and metaphorical
- Remembering childhood through adult lenses
- Spirituality
- Relationships between the human and greater natural world

Students can find other stories that relate to the two read together in any way and create their own thematic collection of narratives, identifying their theme/s however they wish. This can be a small group or whole class activity. Then students can write their own narratives to add to the collection, acknowledging and playing out their membership in the universal society of human storytellers. Student will share and develop their stories and writing in peer editing groups. Depending on the sophistication and aims of the class, some discussion might center on how all people are story tellers, and that in many important ways stories constitute our own most common and powerul learning medium.

Outcomes or productions of the activities:

Students can, finally, determine how they want to compile their collection of their own stories. Students themselves can research possibilities of doing this, including internet publishing, desktop publishing, creative book-making, video production, etc. Besides writing their personal narratives, students might also do inquiry on any aspect of storytelling as a way of learning and knowing and write essays, papers, etc.

What you hope students will gain:

- Appreciation of multicultural literature.
- Understanding of the centrality of storytelling in all cultures and all lives.
- Development of own storytelling resources, strategies, and voice.
- Publishing and sharing strategies and resources.

Evaluation:

In an activity like this one, most if not all evaluative criteria should be developed by students and teacher together. These criteria would be based on mutually determined values and goals for the activity.

Students' gains from this program will be assessed by evaluating the quality of their story telling, in which self and peer evaluation will be combined with teacher evaluation after the class has set evaluation criteria together. One way that students may evaluate their own work is in deciding whether to include it in a highly selective portfolio that will feature a limited number of their best works over the year.

Students' collaborative involvement may be assessed by having them evaluate their own contributions to group efforts as well as those of their peers. Groups may divide up a finite number of points, with the optimum result being equal sharing of points which would show equal contribution by all group members.

The activity itself can also be evaluated cooperatively by student and teacher. If students have set their own learning goals at the beginning, they can later asses how wel they met these goals, whether new ones emerged during the activity and, if so, how well these goals were met, and what suggestions they have for revising the activity. The teacher can separately address criteria she has set for the activity, such as whether it meets the purposes set at the beginning (see above).

Reflection:

Not yet having the opportunity to implement this idea, I feel as if it may be more of a beginning than a final plan. I have selected two stories that I find exciting and meaningful, but I would also have to be sure that these stories are not simply imposed on students. It would be important for me to hold back my own responses to the stories until students have responded fully. I am sure that both stories will raise questions I have not anticipated, and may evoke negative feelings that my initial reaction will be to resent or feel must simply be explained away. It may be, for example, that a student has had a disturbing experience involving some kind of faith healing, or that a student is so firmly entrenched in his or her religious orientation that the treatment of non-Christian beliefs, and in the case of Polingaysi's story negative comments on the behavior of Christian missionaries, are highly offensive. The trick will be to help students see that understanding multiple perspectives, feeling empathy, and considering other experiences and stories as legitimate as one's own does not threaten or demean personal convictions, religious or otherwise. I would also have to be very open about the students' own narratives, difficulties they may encounter in telling a story they feel fits in, and the tension between inviting students to produce their own literature while holding up accomplished narratives as models it may be difficult to emulate. In short, I have to be prepared to truly appreciate the narratives of my "novice" storytellers. Also I have noticed that I've left myself out of this activity, but in reality I would also have to share my story as well as my ideas and responses to the narratives we read.

Attachments:

Summaries of **"The Journey"** and **Chapter Two** from *No Turning Back*

"The Journey", by Duane Big Eagle

In this story a young Indian boy in Mexico, who is approaching adolescence, has a lung disease which is declared incurable by conventional doctors, so his family decides to send him across the border to his aunt, who is a healer in the Yaqui tradition. To get there he has to travel alone on a train and illegally cross the border with only an older cousin, who is employed as a conductor, to look after him. Meanwhile, since the family has money for only one ticket, his father has set off on foot to meet him at his destination. during the train journey, the boy's fever rises as he lapses in and out of consciousness, and through the train window he sees a series of visions, or hallucinations, particularly the recurrent presence of a young woman with long black hair who is usually wearing a red dress. He sees her waving at him and performing various chores, and at one point he sees her face gigantically enlarged and smiling at him from a cliff side, when he notices for the first time a crescent shaped scar on her lip. Finally, he succeeds in reaching his aunt's town, and his father miraculously has gotten there ahead of him to meet the train. He is taken to his aunt's house, where she succesfully performs the healing ceremony, during which he sees more visions of animal shapes and experiences the rising of the painful disease from his chest and finally

out his body. Following that, he sleeps. When he awakens he sees, this time in the flesh, the same black-haired girl whose image had been present throughout his journey, definitely identifiable from the tiny crescent scar on her lip. When he speaks, he tells his father that his journey has been from youth into manhood as well as from sickness to health.

Chapter Two from *No Turning Back* by Polingaysi Ooyawayma

Polingaysi, now an adult, recalls her childhood experience in her Hopi village when missionaries arrived and began setting up churches and schools. Her upbringing had been traditional in all senses, including following the customs of her village and celebrating her religion in the Hopi way. Nevertheless, she also enjoyed singing Christian songs taught her by the missionaries, though she couldn't understand the English words. Her father had a friendly relationship with the missionaries and worked for them.

The Hopi village was divided as to whether they should accept the new ways of the whites or reject them altogether and adhere purely to their Hopi ways. The missionaries made a contract with those who favored accepting new ways, and got the village council to agree to make attendance at the missionary school mandatory for all children. The more conservative members of the village resisted by hiding their children, while missionaries not only came after them but brought along "officers" they had appointed from the Navajos, whom the Hopic feared. When the girls were caught, Polingaysi learned, they were required to exchange their traditional Hopi blanket dresses for cotton "Mother Hubbards" provided by the missionaries. In the school they made strange marks on slates and were given strange food, which she found interesting. For quite a while, Polingaysi managed to escape the missionary hunters, but as more and more of her friends became involved in the school all day, she grew lonely and intrigued by what was going on inside this building. She tried on the dress that had been given to one of her friends and liked it. Finally, instead of being caught, she went to the school and voluntarily entered. When she returned home she was greeted by the angry and sad faces of her family members, and she went out to the mesa to feel her own sadness and confusion I solitude.